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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/582,339	06/09/2006	Akihiro Omori	10993.0273	4988

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EXAMINER	
CHRISTIAN, MARJORIE ELLEN	

ART UNIT	PAPER NUMBER
1797	

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08/14/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/582,339	OMORI ET AL.	
	Examiner	Art Unit	
	MARJORIE CHRISTIAN	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,20-31 and 53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14, 20-31, 53* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Summary

1. This is the initial Office action based on the application filed June 6th, 2009.

2. **Claims 1-14, 20-31, 53** are pending and have been fully considered.

Election/Restrictions

3. **Claims 15-19, 32-52** are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 6/1/9.

Priority

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

5. The information disclosure statement filed 6/9/6 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited **foreign patent document (JP 11-128667**; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. All other items have been fully considered.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. **Claims 1, 5-6, 8-12 rejected under 35 U.S.C. 102(b) as being anticipated by JP 09-187646 MOTOYA et al..**

As to **Claim 1**, MOTOYA discloses a porous formed article comprising an organic polymer resin and an inorganic ion absorbing material (Pg. 3, Para. 5, Lines 8-14) with communicating pores opening at an outer surface and cavities in the interior of a fibril forming a communicating pore, some cavities open at the surface (Pg. 3, Para. 5), and the inorganic ion absorbing material is supported on the outer surface and on the surface of inner cavities (Claim 1).

As to **Claims 5-6, 8**, MOTOYA discloses the inorganic ion absorbing material comprises a hydrated oxide of titanium (Pg. 4, Para. 7) and has a particle diameter of 0.01 to 100 μm (Pg. 4, Para. 8).

As to **Claim 9**, MOTOYA discloses the inorganic ion absorbing material in an amount of 30 to 95% is supported thereon (Pg. 5, Para. 10).

As to **Claims 10-12**, MOTOYA discloses the fibril comprises the organic polymer resin, inorganic ion absorbing material and water-soluble polymer that is polyvinylpyrrolidone (Pg. 5, Para. 9-10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 1-6, 8-14, 20, 53 are rejected under 35 U.S.C. 103(a) as being obvious over JP 09-187646 MOTOYA et al. in view of US Patent No. 5,418,284, CHANG et al..**

As to **Claims 1-4, 14, 20, 53**, MOTOYA discloses a porous formed article (ion absorbent) (Claim 1) comprising an organic polymer resin and an inorganic ion absorbing material (Pg. 3, Para. 5, Lines 8-14) with communicating pores opening at an outer surface and cavities in the interior of a fibril forming a communicating pore such that some of the cavities open at the surface of the fibril (Pg. 3, Para. 5), and the inorganic ion absorbing material is supported on the outer surface of said fibril and on the surface of inner cavities (Claim 1) for removing ions from waste water (Pg. 1, Para. 2). MOTOYA does not appear to expressly disclose that the porous article is spherical and comprises polyacrylonitrile. However, CHANG discloses porous polyacrylonitrile

beads (Abstract) **(Claim 4)** with diameter from 10 microns to a few millimeters (Procedure A, see also Examples) **(Claim 3)** with pores that extend through the outer surfaces of the beads (C10/L57-58), where it would be obvious to have maximum porosity at the surface to improve absorption of the surface treatment (i.e. inorganic absorbing material) **(Claim 2)** and the beads are useful for chromatographic separations (C1/L49-51) **(Claims 14, 20, 53)**.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the porous formed article of MOTOYA to include the spherical beads made of polyacrylonitrile of CHANG. The motivation would have been to use a well known shape and material of construction for an ion exchange column absorbent. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

As to **Claims 5-6**, MOTOYA discloses the inorganic ion absorbing material comprises a hydrated oxide of titanium (Pg. 4, Para. 7).

As to **Claim 8**, MOTOYA discloses the inorganic ion absorbing material has a particle diameter of 0.01 to 100 μm (Pg. 4, Para. 8).

As to **Claim 9**, MOTOYA discloses the inorganic ion absorbing material in an amount of 30 to 95% is supported thereon (Pg. 5, Para. 10).

As to **Claims 10-12**, MOTOYA discloses the fibril comprises the organic polymer resin, inorganic ion absorbing material and water-soluble polymer that is polyvinylpyrrolidone (Pg. 5, Para. 9-10).

As to **Claim 13**, MOTOYA does not appear to expressly the amount of water-soluble polymer contained therein. However, MOTOYA recognizes that the amount of water soluble polymer (binder) as a result effective variable (Pg. 5, Para. 9-10) and it would be obvious to a person having ordinary skill in the art to optimize amount of water soluble polymer present as it has been held that it is not inventive to discover the optimum ranges by routine experimentation. *In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969).*

8. **Claim 7 is rejected under 35 USC 103 (a) as being obvious over JP 09-187646 MOTOYA et al. in view of US Patent No. 5,418,284, CHANG et al. and Handbook of Water and Wastewater Treatment Technology, CHEREMISINOFF.**

As to **Claim 7**, MOTOYA (in view of CHANG) discloses the inorganic ion absorbing material as shown in the rejections above. MOTOYA does not appear to expressly disclose that the inorganic material includes activated carbon impregnated with aluminum sulfate. However, CHEREMISINOFF discloses that activated carbon impregnated with aluminum sulfate is a commonly known coagulant for water treatment (Pg. 136). Therefore, it would be obvious to a person having ordinary skill in the art to include a well-known coagulant for water treatment in the porous article used for water-treatment of MOTOYA in view of CHANG.

9. **Claims 21-31 are rejected under 35 USC 103 (a) as being obvious over JP 09-187646 MOTOYA et al. in view of US Patent No. 5,418,284, CHANG et al. and JP2003-305458, KAZUHIKO.**

As to **Claims 21-24**, MOTOYA (in view of CHANG) discloses the ion absorbent for removing ions from waste water as shown in the rejections above but does not appear to expressly disclose the treatment apparatus. However, KAZUHIKO discloses a pH-controlling device (Fig. 3-5, Ref. 21) and membrane separation device (Para. 23, Ref. 22/23) are installed in a stage before the column (2); and the ion adsorbing device includes water-sending means for supplying a desorption liquid to the column (3 and P).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the ion absorbent of MOTOYA (in view of CHANG) to include the treatment apparatus for waste water of KAZUHIOK, as MOTOYA (in view of CHANG) is absent as to the rest of the equipment for waste water treatment. Naturally, one having ordinary skill would have been motivated to include waste water treatment apparatus with an ion absorbent for use in waste water treatment. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

As to **Claims 25-26**, KAZUHIKO discloses a crystallization tank (11), adding means for adding a crystallizing agent (14), a crystallizer provided with stirring means (Pg. 10, Para. 22), and a membrane separation device (Para. 23, Ref. 22/33) for separating precipitates.

As to **Claims 27-28**, KAZUHIKO discloses liquid-supplying means (Ref. 15/3, Para. 24, 44, 46, 48, 50, Table 1) for supplying an alkaline liquid and for supplying a pH-adjusting liquid which is obtained by separating a liquid from a solid after a crystallization reaction (11, 18) to a column (2).

As to **Claim 29**, KAZUIHKO discloses a pH-adjusting tank (18), a pH meter (controller), a chemical liquid injection pump working with the pH controller, pH-adjusting-liquid-supplying means, and a line (3) for passing water in the pH-adjusting tank to the column (Para. 44, 46, 48), where it is implicit that the pH adjuster line present in tank 18 includes a pump and pH adjusting-liquid-supplying means shown in part 10 of the apparatus (Pg. 16, Para. 40).

As to **Claim 30**, KAZUIHKO discloses liquid-supplying means for supplying wash water to the column (Para. 14).

As to **Claim 31**, KAZUIHKO discloses pH-adjusting means (9, see pH annotation) for adjusting pH of treatment water flowing out from the column (2).

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARJORIE CHRISTIAN whose telephone number is (571)270-5544. The examiner can normally be reached on Monday through Thursday 7-5pm (Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/

Primary Examiner, Art Unit 1797

MC